

REMARKS

Claims 1-18 are pending in the application, of which claim 1 is independent. Favorable reconsideration and further examination are respectfully requested.

The Examiner has rejected claims 1-5 and 10-16 under 35 U.S.C. §102(b) as being anticipated by *Graimann* (US 6,307,494). The Examiner has also rejected claims 6-9 and 17-18 under 35 U.S.C. §103(a) as being unpatentable over *Graimann* or *Graimann* in view of one of *Lu* (US 6,680,249), *Yu* (US 6,025,272), or *Yoo* (US 2002/0197823).

Graimann describes fabricating a trench structure by forming a first plug 38 in a lower portion of a trench 21 and subsequently filling the remainder of trench 21 with a second plug 37 (see Figures 2-4). To form the first plug 38, "trench 21 is filled ... to the same level as that of the thin oxide layer 33, i.e., line 39" (col. 5, lines 34-36). *Graimann* thus teaches filling the trench 21 to a desired level to form plug 38. There is no reason in *Graimann* to change this level, since after all, the level is *already* the desired level. Not surprisingly, *Graimann* fails to describe or suggest a process that includes filling the trench with a filler material and then *removing* the filler material from an upper region of the trench, as shown in Applicant's figures 1C and 1D and recited in claim 1.

Claim 1 further recites removing the filler material from a lower region of the trench. The Examiner refers to figure 10 of *Graimann* as disclosing this limitation (see Office Action page 2, lines 22-23). However, figure 10 merely shows an empty trench into which filler material has yet to be introduced. The trench 22 shown in figure 10 is subsequently filled with filler material 30 seen in figure 12. There is no indication that this filler is ever removed. Accordingly, *Graimann* fails to describe or suggest a process that includes removing the filler material from a lower region of the trench as recited in Applicant's claim 1.

Claim 2 recites selecting the filler material to be either a liquid filler or a filler material that is able to flow. *Graimann* uses polysilicon as the filler material. However, polysilicon is neither a liquid nor able to flow at temperatures used in semiconductor manufacturing processes. Therefore, *Graimann* fails to describe or suggest using a material that is either a liquid or able to flow as recited in Applicant's claim 2.

Claim 4 includes providing a second liner on the trench wall prior to filling the trench, removing the second liner from the lower region of the trench, and using the first liner as a mask after removal of the filler material. The Examiner refers to figure 10A of *Graimann* as disclosing these limitations (*see* Office Action page 3, lines 9-12). However, as described above, figure 10 merely shows an empty trench into which filler material has yet to be introduced. There is no indication that *Graimann* deposits a second liner, removes the second liner from the lower region of the trench, and uses the first liner as a mask after removal of the filler material. Accordingly, *Graimann* fails to describe or suggest a process as recited in Applicant's claim 4.

Claims 2-18 depend from claim 1 and are patentable for at least the same reasons as claim 1.

In view of the foregoing amendments and remarks, the entire application is believed to be in condition for allowance, and such action is respectfully requested.

Please apply any charges or credits to deposit account 06-1050.

Respectfully submitted,

Date: 12-28-04



Faustino A. Lichauco
Reg. No. 41,942

Fish & Richardson P.C.
225 Franklin Street
Boston, MA 02110-2804
Telephone: (617) 542-5070
Facsimile: (617) 542-8906